

Fall Protection

When you finish reviewing this article, be sure to take the Fall Protection Test for credit. Continue to the next page.

Section I

Introduction

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As employees, you need to be aware of the types of falls that can occur in the workplace. Some of these falls cause more severe injuries than others.

Types of falls

- Falls from same level
 - Slips
 - Trips
 - High frequency rate
 - Low injury severity rate



One type is “falls from the same level.” This involves falling at the same level and results in a person falling to the floor or to the ground. Examples include slips and trips. Slips and trips have a high frequency rate, but a low injury severity rate.

Types of falls

- Falls from an elevation – falling from one level to another
 - Relatively low frequency rate
 - High injury severity rate



Another type is “falls from an elevation.” This involves falling from one level to another. Falling from a scaffold to the ground below is one example of this kind of fall. These types of falls have a relatively low frequency rate, but a high injury severity rate.

Section II

Fall Protection Systems

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Fall protection systems

- Guardrail systems and toeboards
- Handrail and stair rail systems
- Designated areas



Various fall protection systems are found throughout the facility. Some of these are:

Guardrail systems and toeboards – A guardrail is a vertical barrier, normally consisting of an assembly of top rails, mid rails and posts, erected to prevent employees falling from lower levels. A toeboard is a barrier placed to prevent materials from falling to a lower level, or to keep an employee's feet from slipping over the edge.

Handrail and stair rail systems – A handrail is used to assist employees going up or down stairs, ramps or other walking/working surfaces by providing a handhold for support. A stair rail protects employees from falling over the edge of an open-sided stairway.

Designated areas – this refers to a space which has a perimeter barrier erected to warn employees when they approach an unprotected side or edge, and serves, also, to designate an area where work may be performed without additional fall protection.

Common fall protection systems

- Hole covers
- Safety net systems
- Ladder cages



Hole covers – These guard floor holes between one and twelve inches wide. They must be securely held in place to prevent materials from falling through.

Safety net system – Safety nets are non-rigid barriers supported in such a manner as to catch employees who have fallen off a work surface and to bring them to a stop before contacting surfaces or structures below.

Ladder cages – Ladder cages are barriers surrounding or nearly surrounding the climbing area of a ladder. It fastens to the ladder's side rails, to one side of the rail, or to other structures.

Common fall protection systems

- Ramps and bridging devices
- Slip-resistant floors
- Effective housekeeping



Ramps and bridging devices – A ramp is an inclined surface between different elevations so that employees, vehicles or both can pass. A bridging device is a surface that spans a gap between a loading dock and a vehicle or between vehicles. It may be fixed, portable, adjustable, powered or unpowered. It may also be called a car plate or dockboard.

Slip-resistant floors – Slip-resistant flooring material such as textured, serrated, or punched surfaces and steel grating may increase slip-resistance. These type of floor surfaces should be installed in work areas that are generally slippery because of wet, oily or dirty operations. Slip-resistant footwear may also be useful in reducing slipping hazards.

Of course, one of the best ways to minimize fall hazards is with good housekeeping. Use absorbents to clean up a spill when oil materials or corrosive liquids are spilled.

(Hand out Fall Protection Safety)

Section III

Falling

Understanding falls can help you appreciate the importance of preventive measures as well as the importance of personal fall protection.

Falling

- Person loses balance
- Body unintentionally moves from an upright position to a prone or semi-prone position



Whenever a person loses his/her balance and the body unintentionally moves from an upright position to a prone or semi-prone position, then a fall occurs.

Falling

- Free-fall velocity at impact when falling 12 feet is nearly 20 M.P.H.
- Person hits the ground in less than one second from this distance

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The free-fall velocity at impact when falling 12 feet is nearly 20 miles per hour. This means the person will hit the ground in less than a second after falling this distance.

Falls are dangerous

Three primary elements:

- Free-fall distance the worker falls
- Shock absorption at impact
- Body weight of the worker

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Falls are dangerous because of three primary elements:

- The free-fall distance the worker falls
- The shock absorption at impact
- The body weight of the worker

Free-fall distance

- Uncontrolled length of travel before a worker hits the floor, ground, or before fall arrest equipment activates
- OSHA measures as the foot level before the fall to the foot level after the fall



Free-fall distance refers to the uncontrolled length of travel before the worker hits the floor or ground, or when fall arrest equipment activates. OSHA measures the free-fall distance as the foot level before the fall to the foot level after the fall.

Free-fall distance

Free-fall distance should be limited to a few feet so as to prevent injury from:

- collisions with grade level
- collisions with obstructions
- High arresting forces from fall arrest equipment
- pendulum-like swings that result in collision with objects

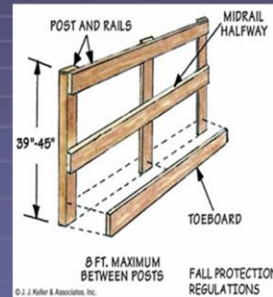
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The free-fall distance should be limited to a few feet in order to prevent injury from:

- Collisions with grade level
- Collisions with obstructions near the work site
- High arresting forces from fall arrest equipment
- Pendulum-like swings that result in collisions with objects

Shock absorption at impact

- Varies according to the types of fall protection equipment used
- Shock-absorbing lanyards attached to body harness reduce the probability of injury



Shock absorption varies according to the type of fall protection equipment that is used. For example, falling to the end of a rope lanyard while wearing a body belt provides limited shock-absorbing capabilities, often resulting in injuries to the worker.

A shock-absorbing lanyard attached to a full-body harness, however, can substantially reduce the probability of injury because of the increased shock-absorbing capability of the equipment.

Body weight of the worker

- Falls have more severe impact on heavy workers
- Fall arrest equipment may not properly fit heavy workers with larger waistlines

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The final element that makes falling hazardous is the actual weight of the worker. Falls of all kinds generally have a more severe impact on heavy workers and heavy users of fall arrest equipment. This is partially because heavier users of fall arrest equipment may have disproportionately larger waist lines. Thus, the fall arrest equipment does not always fit properly, resulting in more severe and disabling injuries when the fall occurs.

Fall arrest systems

- Used when engineering controls are not feasible or sufficient to eliminate the risk of a fall
- Disabling injuries can be prevented with proper use of equipment

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When engineering controls are not feasible or sufficient to eliminate the risk of potential injury from falling, personal fall protection systems will be required. Disabling injuries from falls are common, but with proper use of personal fall arrest equipment, many of these disabling injuries can be prevented.

Fall arrest systems

Fall arrest systems prevent:

- a worker from falling more than 6 feet
- a worker from contacting any lower level during arrest of a fall



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The kind of personal fall arrest system selected should match the particular work situation. Personal fall arrest systems are intended to:

Prevent a worker from falling more than 6 feet; and

Prevent a worker from contacting any lower level during arrest of a fall.

Fall arrest systems

Fall arrest systems limit maximum arresting force on an employee to:

- 900 pounds when a worker uses a body belt
- 1,800 pounds when worker uses a body harness

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Fall arrest systems should limit the maximum arresting force on an employee to:

- 900 pounds when the worker uses a body belt
- 1,800 pounds when the worker uses a body harness

Fall arrest systems

Fall arrest systems:

- Bring worker to stop and limit deceleration travel distance to 3½ feet
- Have strength to withstand twice the impact energy of a worker falling a distance of 6 feet
or
- Have strength to withstand the free-fall distance permitted by system, whichever is less

The fall arrest system should bring a worker to a complete stop and limit the deceleration distance that a worker travels to 3 ½ feet. It should also have sufficient strength to withstand twice the potential impact energy of a worker free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

Section IV

Personal Fall Protection

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Person fall protection systems are necessary in certain situations and employees need to know the proper equipment to use.

Personal fall protection

- Personal fall arrest system
- Positioning device system
- Personal fall protection system for climbing activities



Personal fall protection systems include:

- Personal fall arrest system – This system is used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline or combinations of these.
- Positioning device system – This is a system of equipment or hardware which, when used with the body belt or body harness, allows an employee to be supported on an elevated vertical surface such as a wall or windowsill, and work with both hands free.
- Personal fall protection system for climbing activities – This system is designed to prevent an employee from being injured should the employee fall while ascending or descending

Section V

Training

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Training

It is important to have the proper training in fall protection and the training should include more than just how to use the equipment.

Training

- Equipment inspection
- Application limits
- Methods of use
- Put on, adjust, and connect equipment



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The training should cover:

- Equipment inspection
- Application limits, including how to estimate and limit the maximum arresting force to acceptable limits for the system
- Methods of use, including intended functions and performance of equipment
- How to put on, adjust, and connect the equipment

Training

- Anchoring and tie-off techniques
- Emergency rescue plans and implementation
- Maintenance procedures
- Storage techniques

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In addition, the training should include:

- Anchoring and tie-off techniques
- Emergency rescue plans and implementation
- Maintenance procedures
- Storage techniques
- (Conduct "Fall Protection Equipment Demonstration"

Vendor/Supplier information

Vendor instructions for fall arrest system use and application includes:

- Force measured during sample force test
- Maximum elongation measured for lanyards during force test
- Deceleration distance measured for devices during force test

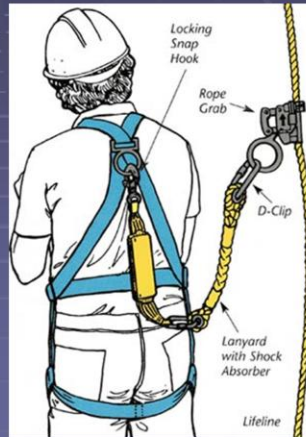
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Always get comprehensive instructions for the system's proper use and application from the supplier. This should include:

- The force measured during the sample force test
- Maximum elongation measured for lanyards during the force test
- The deceleration distance measured for deceleration devices during the force test

Vendor/Supplier information

- Caution statement
- Application limits
- Proper hook-ups, anchoring and tie-off techniques



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Also be sure to get:

Caution statement on critical use limitations

Application limits

Proper hook-ups, anchoring, and tie-off techniques, including the proper D-ring or other attachment points to use on the body belt and harness for fall arrest.

Vendor/Supplier information

- Proper climbing techniques
- Methods of inspection, use, cleaning and storage
- Specific lifelines to be used

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The supplier should also provide:

- Proper climbing techniques
- Methods of inspection, use, cleaning, and storage
- Specific lifelines to be used

Section VI

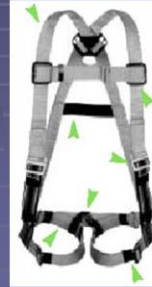
Reporting Fall Hazards

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Reporting fall hazards is integral to any effective safety effort.
Employees should report unsafe equipment, conditions, or procedures.

Reporting fall hazards

- No repercussions from reporting hazards
- Equipment repair receives top priority
- Defective equipment will not be used



Employees will not experience repercussions from reporting hazards. Equipment repair receives top priority. Under no circumstances should defective fall protection equipment be used.

Reporting fall hazards

- When fall condition exists:
 - Take short steps
 - Keep toes pointed out
 - Walk on the whole foot when crossing rough or slippery surfaces
 - Avoid sharp turns

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If a slip or fall condition does exist, take short steps with toes pointed out. Walk on the whole foot when crossing rough or slipper surfaces and don't make any sharp turns.

Reporting fall hazards

- If fall starts to happen:
 - Protect head and neck
 - Relax
 - Don't resist fall
 - Roll as you land

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If a fall starts to happen, protect your head and neck from injury by looking at the spot you are about to hit. Relax, go limp, and don't resist the fall. As you land, roll.

Reporting fall hazards

- Use fall protection equipment if fall situation exists
- Disciplinary actions for failure to use equipment



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It is critical to use fall protection equipment if a potential fall situation exists. Supervisors will enforce the discipline policy for failure to use assigned fall protection equipment.

It is easy to form unsafe work habits. We all get sloppy with some of our actions because it is easier. Some times you may think it will take too much time to get harnessed. However, when you decide not to use fall protection equipment, you put yourself, and possibly others, at risk.

Section VII

Summary

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Summary of main points

- Types of falls
- Fall protection systems
- Elements of dangerous falls
- Personal fall protection equipment
- Vendor supplied information
- Reporting fall hazards

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Questions?

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Now take the test on Fall Protection for credit!